

Appendix D – Northern Long-Eared Bat Survey Report

Final Report

Project: Northern Long-eared Bat Surveys in the TH 53 Project Area

State Project Number (SP): 6918-80

MnDOT Contract Number: 06453

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Minnesota Biological Survey

MNDNR, Ecological and Water Resources

Date: 26 December 2014



Figure 1. (above)
Northern Long-eared
Bat.

Photo: New York Dept.
of Environ. Cons.

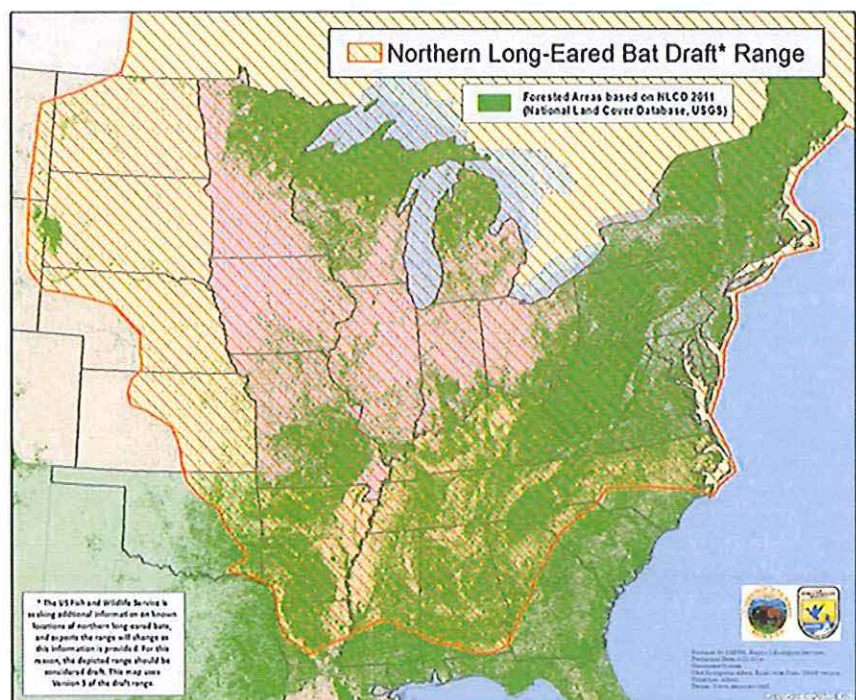
Figure 2. (right) Range
of Northern Long-eared
Bat in the eastern
United States.

Source: U.S. Fish and
Wildlife Service.

Project Overview

At the request of United Taconite, the Minnesota Department of Transportation (MnDOT) is considering five potential alignments of US 53 in the Quad Cities area of the Iron Range (refer to Figure 4.41. Cultural Resources, attached, for locations of alignments). This project area is within the winter and summer range of the Northern Long-eared Bat (*Myotis septentrionalis*; NLEB; Figures 1, 2). Thus, any of these alternatives, except perhaps the "No Build" alternative, has the potential to impact this species through removal of roosting trees, destruction of winter habitat and inadvertent taking of bats.

The U.S. Fish and Wildlife Service (USFWS) is currently evaluating this species for federal listing under the Endangered Species Act.



Final determination is scheduled for spring 2015. In the meantime, the USFWS has issued guidance and recommendations for consideration of NLEB in project planning (*Northern Long-eared Bat Interim Conference and Planning Guidance, January 6, 2014*; <http://www.fws.gov/midwest/endangered/mammals/nlba/pdf/NLEBinterimGuidance6Jan2014.pdf>).

The Minnesota Department of Natural Resources (MNDNR) entered into an agreement with MnDOT to assess the TH 53 project area for the summer presence and potential winter presence of NLEB.

Methods

Protocol and survey methods employed followed those described in the *NLEB Interim Conference and Planning Guidance* and the *2014 Rangewide Indiana Bat Summer Survey Guidelines, January 13, 2014*; <http://www.fws.gov/Midwest/endangered/mammals/inba/surveys/pdf/2014IBatSummerSurveyGuidelines13Jan2014.pdf>).

Assessment of the presence of NLEB in the TH 53 project area included:

1. Review of existing information on the presence on NLEB in the project area.
2. Assessment of suitable summer habitat in the project area through aerial photography and ground surveys.
3. Assessment of potential winter hibernacula in the project area through aerial photography and ground surveys.
4. Acoustic surveys for summer presence. AnaBat SD2 bat detectors were set along the alternative alignments; one detector set for every kilometer (0.6 mile) of potential roadway and operated for a minimum of 2 nights. All summer presence/absence surveys were completed before August 15.

The presence of NLEB was determined by first processing call files through two identification software programs, approved by the USFWS (refer to *Acoustic Bat Identification Software Testing Criteria – Draft January 2013*; <http://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/AcousticPrgrmDrftTestCriteria3Jan13.pdf>). All high frequency myotis calls identified by the software programs were then visually evaluated by a skilled biologist.

5. Acoustic surveys for fall swarming activity outside mine portals and other features. Evidence of bat swarming activity may indicate that winter hibernacula exist. AnaBat SD2 bat detectors were set outside voids and rock crevices that could be portals to potential winter hibernacula. Detectors were operated a minimum of 2 nights at each site. This was repeated at least 2

weeks later; both survey bouts were conducted between September 1 and October 31. Calls were identified according to the procedure described for summer presence surveys (#4, above).

Results and Discussion

Call File Analysis

Approved software programs selected for bat call identification were *BCID East* (Version 2.5c, Ryan Allen, Bat Call Identification, Inc.) and *EchoClass* (Version 2.0, Eric Britzke, U.S. Army Engineer Research and Development Center). A total of 25,547 call files were recorded from all sites and time periods. Of that total, BCID identified approximately 14,700 files as bats, EchoClass identified 15,784, and the remaining files were rejected as "noise." Both programs identified many high frequency myotis calls (≥ 35 kHz) at all sites.

Although the software programs provide an automated analysis of large datasets, hence saving a great deal of time, they have their limitations. Bat calls can be quite variable depending on foraging habitat and behavior of the bats. The detectors do not always record clear or complete calls. This variation in calls is difficult for software programs to accommodate and results in a degree of error that may be unsatisfactory for some assessments. Determination of the presence of NLEB should never rely solely on the results of identification software.

The resulting call analyses by these two programs differed greatly in the species identified and their relative abundance. Because of this, it was decided that an individual, skilled in bat call identification, would review all call files, paying particular attention to any potential NLEB calls.

Assessment of Northern Long-eared Bats

1. Existing information.

The nearest known occurrences of NLEB during summer and winter from the Soudan Underground Mine/Lake Vermillion area, approximately 25 miles from the TH 53 project area.

2. Suitable summer habitat.

Based on aerial photography and ground surveys, suitable forest habitat and foraging openings along forest edges and near water were identified.

3. Potential winter habitat.

Based on a map of the old mine drifts provided by MNDOT (Figure 3) and ground surveys (Figure 4), several potential locations for winter hibernacula were tentatively identified.

4. Summer presence surveys.

Twelve sites were surveyed between 24 July and 8 August 2014 along the alternative alignments (sites 1-12, Figure 5). Detectors were run 3-4 nights and habitat of the site and nearby trees were described (Appendix 1).

NLEB were detected at each site by identification software and verified by MNDNR biologist. All bat species identified at each site are summarized in Table 1. Relative abundance of bat species at each site, and a comparison of results from the two software programs, is illustrated in Appendix 2. Both software programs showed sites 2 and 3 had the most calls identified as NLEB, however, after review by MNDNR, site 5 actually had more NLEB calls (Figure 6). While higher numbers or percentages indicate more NLEB activity at these sites, they do not confirm the presence of maternity roost trees.

Survey results showed that NLEB are widespread throughout the project area and are definitely foraging here. Proof that bats are using trees in the area for maternity roosts can only be confirmed with telemetry studies. Based on NLEB telemetry work conducted in June 2014, female NLEB may fly as far as 1.5 miles between foraging and roosting areas, but generally fly 0.5 miles. Trees chosen for roost sites varied by species and size -- trembling aspen were the most common tree used, but also red oak, red maple, basswood, black ash and jack pine. Tree size varied from 5 to 24 cm dbh (diameter breast height) and included living trees and snags (Catton, T. J. 2014. *Summary of the 2014 Minnesota Northern long-eared bat summer habitat use in Minnesota project (preliminary report)*). Considering the presence of suitable roost trees, the size of the project area and the average distance traveled by female NLEB, it should be expected that female NLEB roost on the project area.

5. Potential hibernacula.

Four potential fall swarming sites were surveyed between 2 September and 8 October 2014 (sites 165, 168-170, Figure 5). Detectors were set out twice at each site and run for 2-3 days (Appendix 1).

NLEB were detected at each site by identification software, but were not confirmed by MNDNR biologist for site 165. Figure 7 compares the average number of bat calls/detector night identified by the two software programs. While all sites showed bat activity in September, only site 165 showed a substantial number of call files for October (n=1150 for BCID and n=999 for EchoClass). This site was the potential portal originally identified by MnDOT (Figures 3, 4) and suggests that fall swarming activity was taking place there. The majority of calls at this site were Little Brown Bats. While it is expected that this species would be the most abundant occupant of any hibernaculum at this site, it is possible that NLEB also hibernate here.

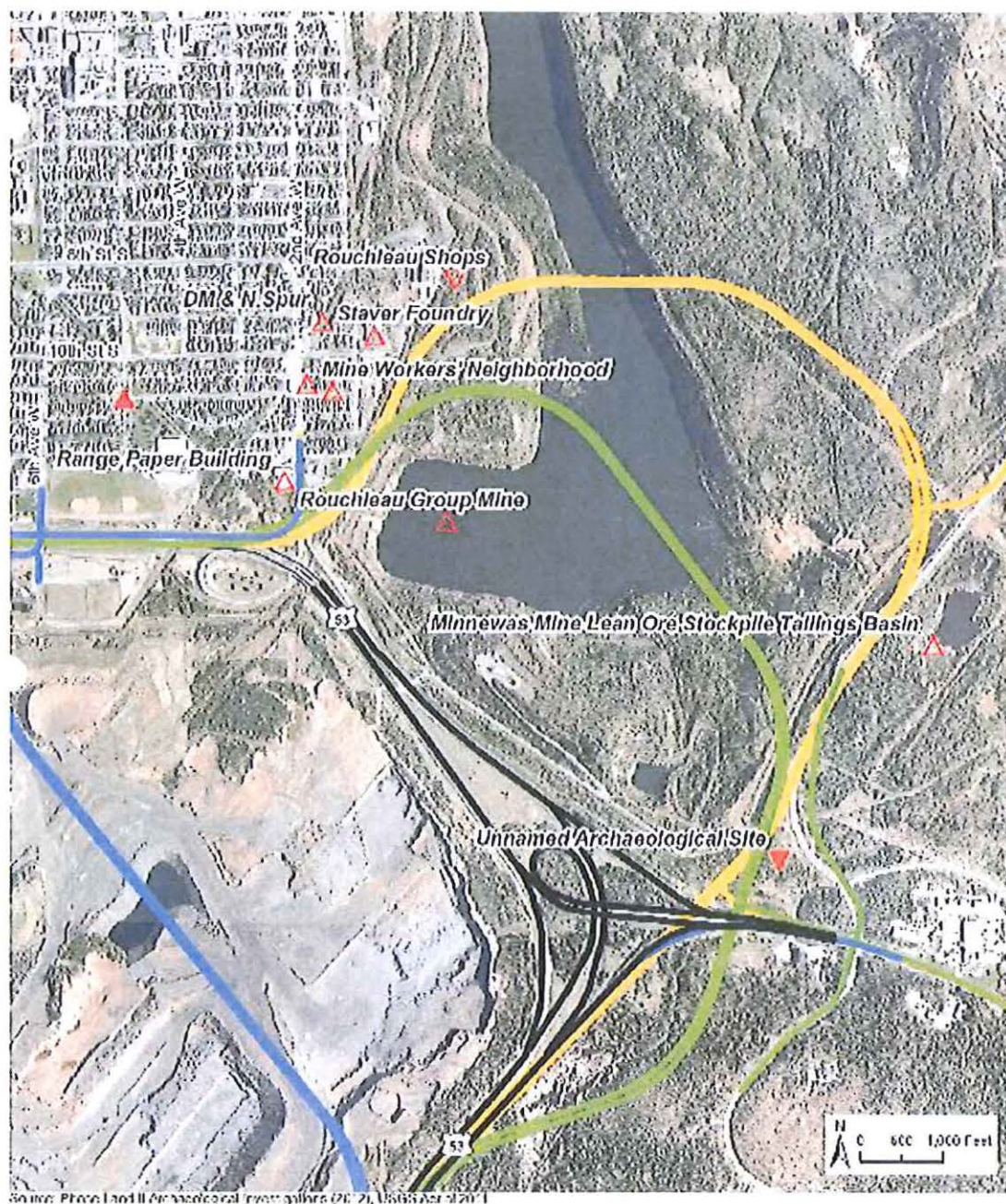


Figure 4.4-1
Cultural Resources
US Highway 53 Virginia to Eveleth
Draft Environmental Impact Statement

Figure 3. Locations of old UAM mine drifts and possible portal (identified as red dot).
Source: Minnesota Department of Transportation.

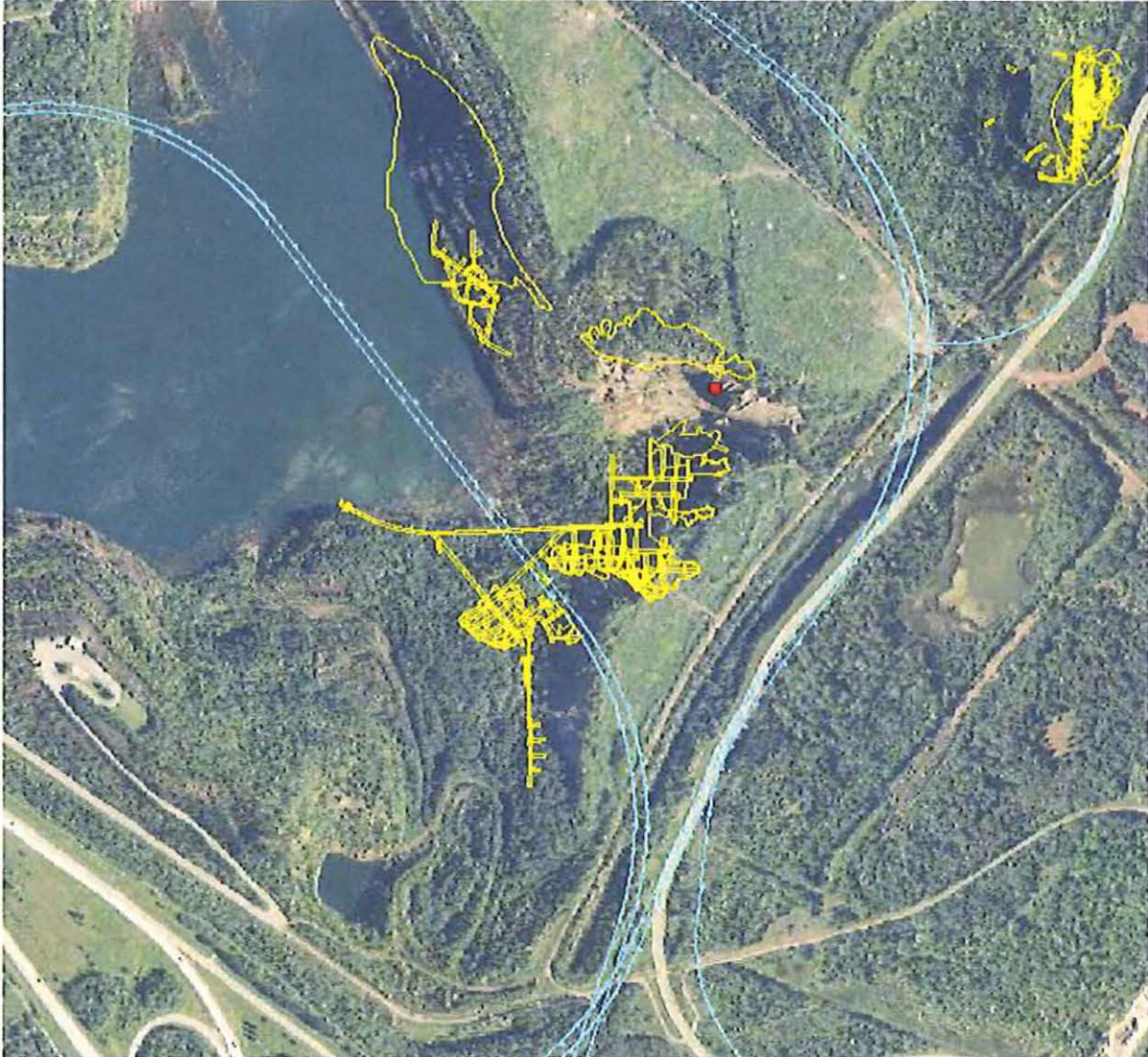


Figure 4. Deep crevice and potential portal in pit wall (red dot in Figure 3).

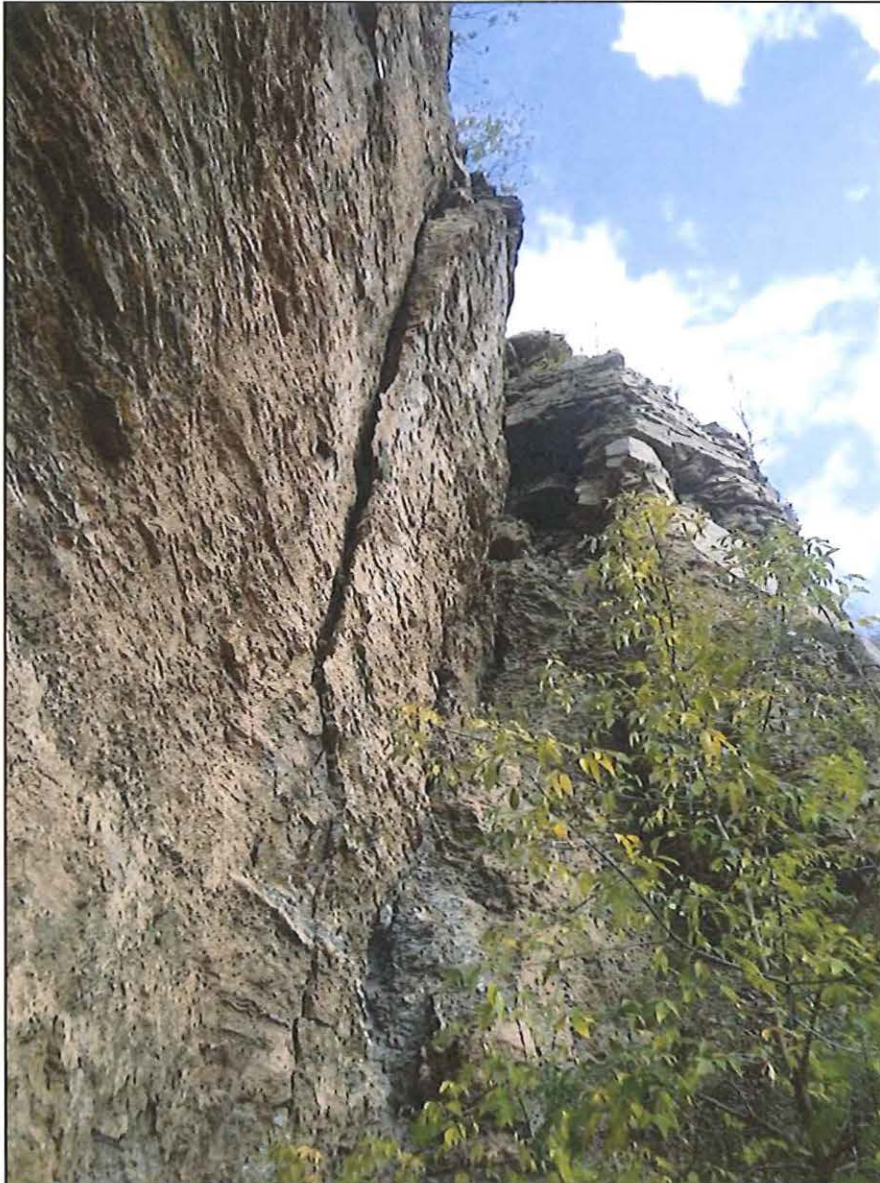


Figure 5. Locations of acoustic surveys in TH 53 project area.



Figure 6. Percent calls identified as NLEB among summer presence survey sites; results of BCID and EchoClass analyses (upper graph) and after qualitative analysis by MNDNR biologist (lower graph).

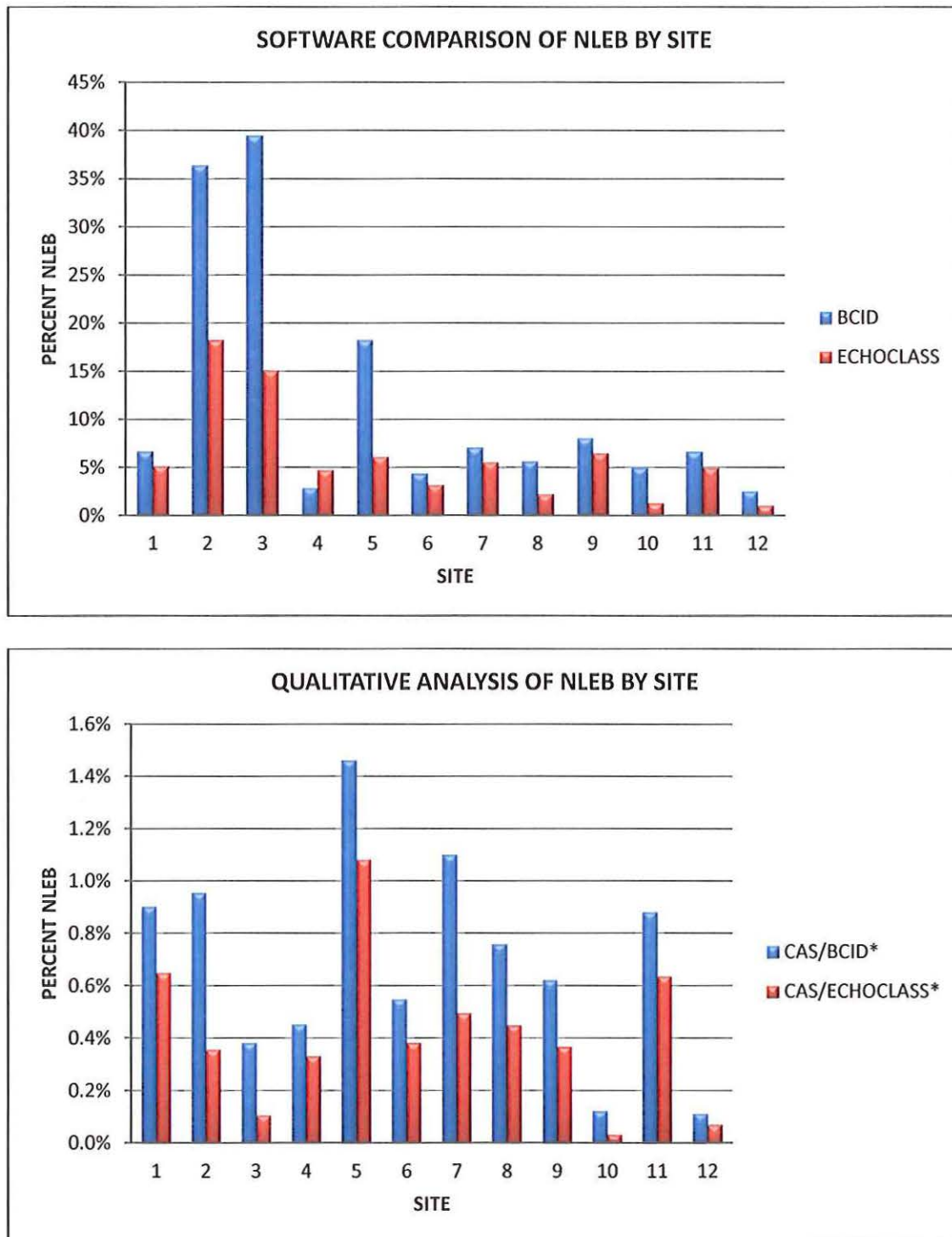


Figure 7. Average number of calls per detector night at potential winter hibernacula sites for September and October survey periods.

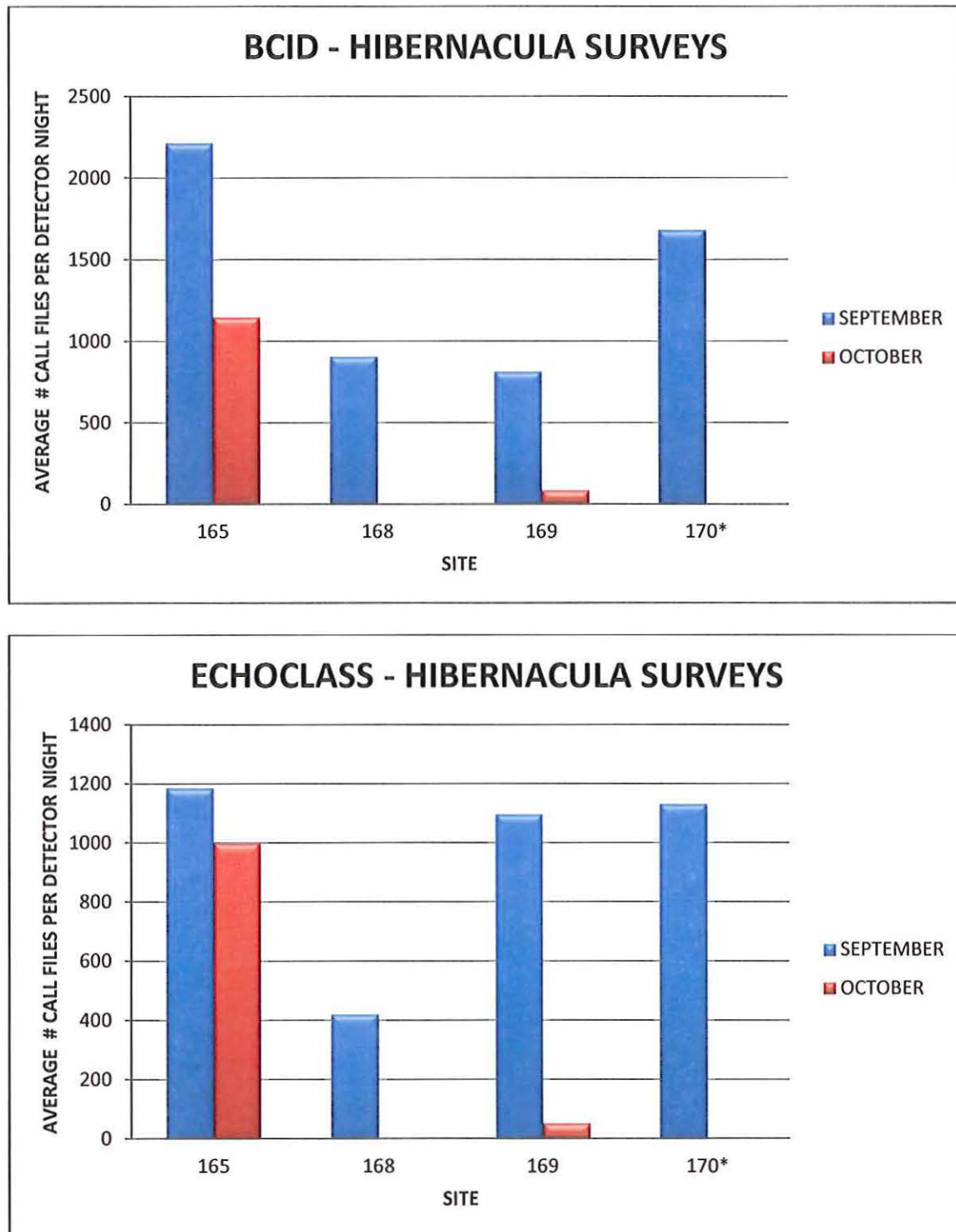


Table 1. Bat species documented at summer presence survey sites in the TH 53 project area.

Site #	Bat Species (number indicates if identified by 1 or 2 software programs)						
	Myse	Mylu	Epfu	Pesu	Lano	Labo	Laci
1	2	2	2	1	2	2	2
2	2	2	2	2	1	2	2
3	2	2	2	1	1	2	1
4	2	2	2	1	2	2	2
5	2	2	2	2	2	2	2
6	2	2	2	2	2	2	2
7	2	2	2	1	2	2	1
8	2	2	1	1	2	2	1
9	2	2	2	1	2	2	2
10	2	2	2	1	2	2	2
11	2	2	2	1	2	2	2
12	2	2	2	1	2	2	2

Species codes:

Myse – Northern long-eared bat (*Myotis septentrionalis*)

Mylu – Little brown bat (*Myotis lucifugus*)

Epfu – Big brown bat (*Eptesicus fuscus*)

Pesu – Tricolored bat (*Perimyotis subflavus*)

Lano – Silver-haired bat (*Lasionycteris noctivagans*)

Labo – Eastern red bat (*Lasiurus borealis*)

Laci – Hoary bat (*Lasiurus cinereus*)

Appendix 1. Site descriptions for acoustic recording locations (refer to Figure 5 for map of locations).

Summer Presence Sites

*some detectors were set out for 4 nights, but only 3 nights had recordings.

Site 1

Location: 534486E, 5261812N (NAD83, Zone 15)

Run time: 24-27 Jul 2014 (4 nights)



Disturbed forest patch near residential area.
Nearest tree was green ash; trembling aspen and speckled alder nearby.

Site 2

Location: 536191E, 5260907N (NAD83, Zone 15)

Run time: 24-26 Jul 2014 (3 nights)

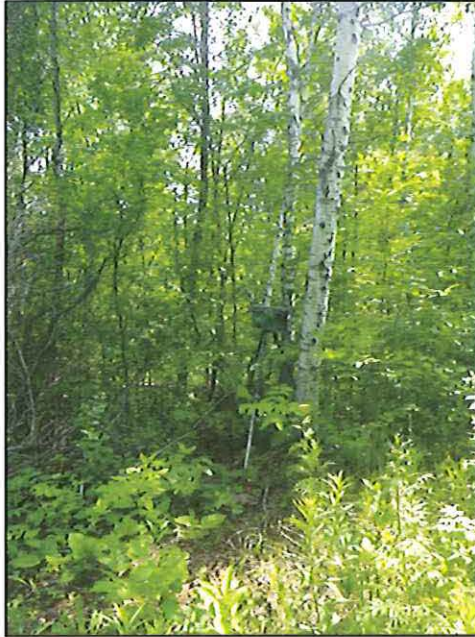


Description: Along trail in mixed coniferous-deciduous forest. Nearest tree trembling aspen; sugar maple, paper birch and mountain maple nearby.

Site 3

Location: 536330E, 5261156N (NAD83, Zone 15)

Run time: 24-26 Jul 2014* (3 nights)



Description: Along trail in mixed coniferous-deciduous forest. Nearest tree trembling aspen; paper birch and balsam poplar nearby.

Site 4

Location: 536684E, 5261777N (NAD83, Zone 15)

Run time: 24-27 Jul 2014 (4 nights)



Description: Along roadside in trembling aspen stand.

Site 5

Location: 536662E, 5262292N (NAD83, Zone 15)

Run time: 24-26 Jul 2014* (3 nights)

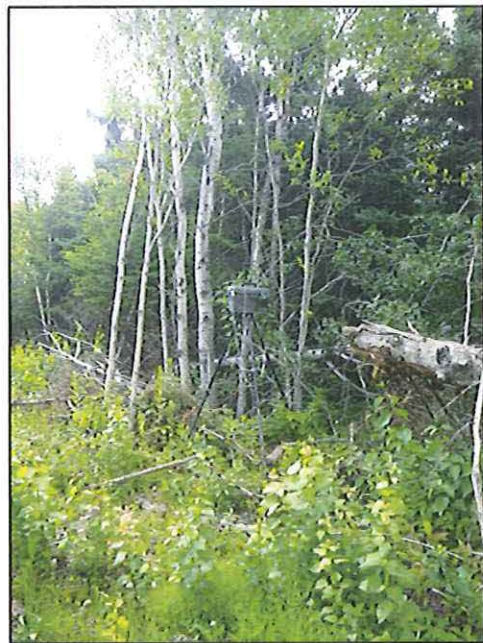


Description: Along powerline in mixed coniferous-deciduous forest. Nearest tree trembling aspen; paper birch, red maple nearby.

Site 6

Location: 536163E, 5262593N (NAD83, Zone 15)

Run time: 24-26 Jul 2014* (3 nights)



Description: Along opening in white spruce-trembling aspen forest.

Site 7

Location: 535337E, 5260183N (NAD83, Zone 15)

Run time: 4-7 Aug 2014 (4 nights)



Description: Forest edge near mining operations. Nearest tree red maple; paper birch, basswood and ironwood nearby.

Site 8

Location: 535578E, 5260233N (NAD83, Zone 15)

Run time: 4-6 Aug 2014* (3 nights)

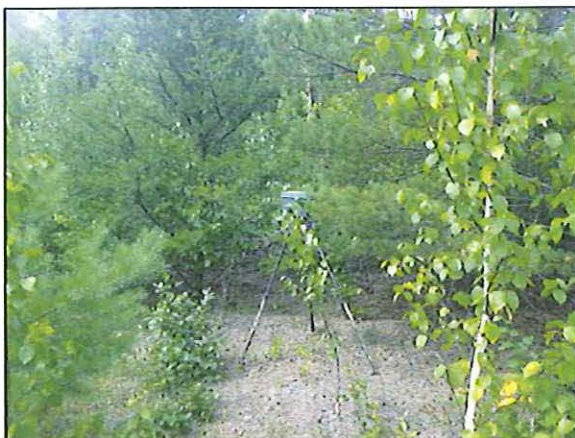


Description: Along edge of disturbed forest patch facing a field. Nearest tree green ash; trembling aspen nearby.

Site 9

Location: 536176E, 5261471N (NAD83, Zone 15)

Run time: 4-76 Aug 2014* (3 nights)



Description: Along roadside of young trees in old mine pit. Nearest tree red pine; jack pine, white spruce, trembling aspen nearby.

Site 10

Location: 535914E, 5261746N (NAD83, Zone 15)

Run time: 4-6 Aug 2014* (3 nights)



Description: Along south edge of Rouchleau Mine pit lake in young forest. Nearest tree paper birch; trembling aspen and red pine nearby.

Site 11

Location: 535601E, 5262198N (NAD83, Zone 15)

Run time: 4-7 Aug 2014 (4 nights)



Description: Along roadside at north edge of Rouchleau Mine pit lake. Nearest tree trembling aspen; mountain maple nearby.

Site 12

Location: 535549E, 5263438N (NAD83, Zone 15)

Run time: 4-7 Aug 2014 (4 nights)



Description: Along edge of cliff overlooking north end of Rouchleau Mine pit lake, young forest. Nearest tree trembling aspen; white pine nearby.

Potential Hibernacula Surveys

Site 165

Location: 536461E, 5261976N (NAD83, Zone 15)

Run time: 2-4 Sep 2014, 3-4 Oct 2014 (3, 2 nights)

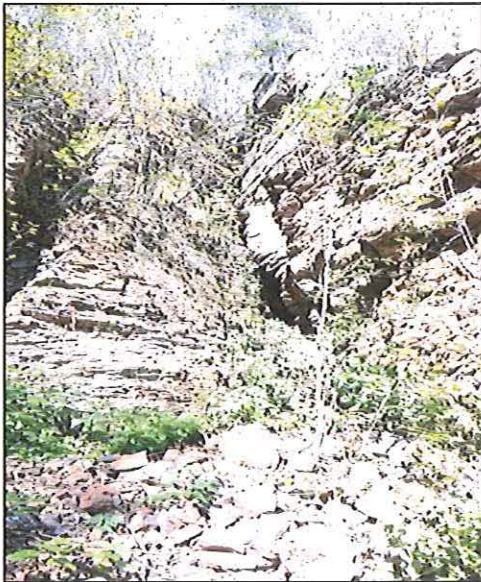


Description: Potential connection to old drift with adjacent vertical crevice, east of the Rouchleau Mine pit lake.

Site 168

Location: 536878E, 5262371N (NAD83, Zone 15)

Run time: 2-4 Sep 2014, 3-5 Oct 2014 (3, 3 nights)



Description: Crevice of unknown depth on northwest side of pit; southeast-facing. Rock faces in this area exhibit numerous smaller crevices and loose rock.

Site 169

Location: 536111E, 5261384N (NAD83, Zone 15)
Run time: 3-4 Sep 2014, 3-5 Oct 2014 (2, 3 nights)



Description: Small mine pit lake on the west side of the private access road to Rouchleau pit. Small fissures and crevices noted adjacent to the area along rock faces.

Site 170

Location: 535970E, 5261765N (NAD83, Zone 15)
Run time: 3-4 Sep 2014 (2 nights)

Description: Rouchleau Mine pit lake adjacent to the rock formation to the east of the access road. Some sparse fissures noted in the rock face, but no holes. Due to work being done in the area, only one survey bout was done.

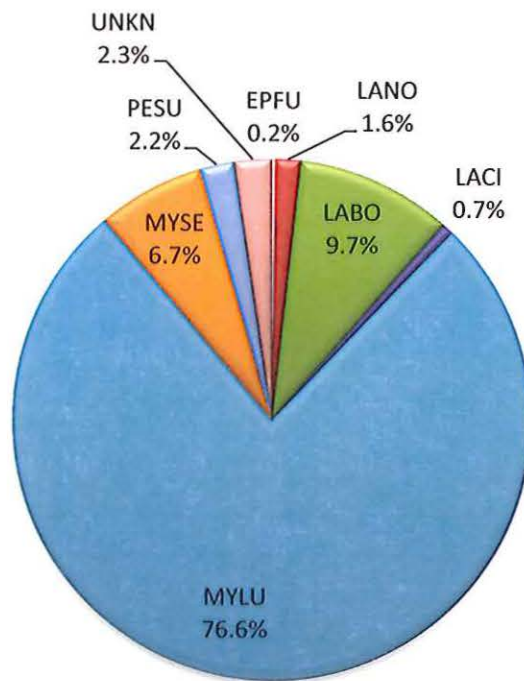
Appendix 2. Relative abundance of bat species recorded at summer presence survey sites, based on analysis by BCID East and EchoClass software programs.

Species codes:

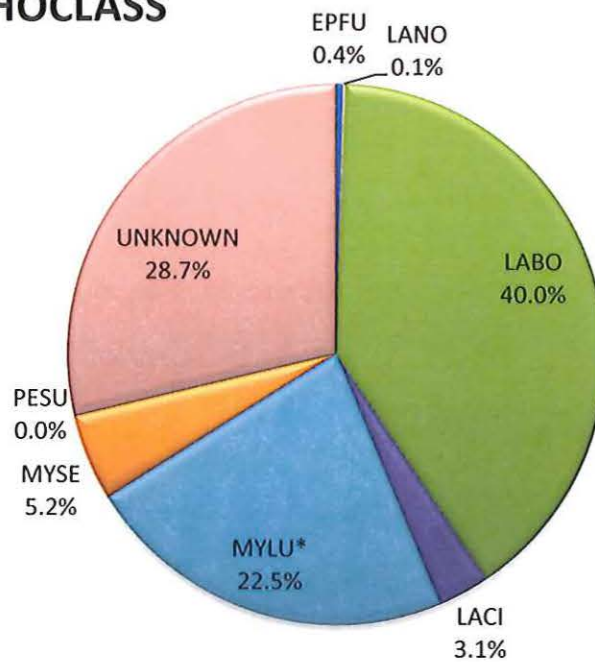
Myse – Northern long-eared bat (*Myotis septentrionalis*)
Mylu – Little brown bat (*Myotis lucifugus*)
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Pesu – Tricolored bat (*Perimyotis subflavus*)
Lano – Silver-haired bat (*Lasionycteris noctivagans*)
Labo – Eastern red bat (*Lasiurus borealis*)
Laci – Hoary bat (*Lasiurus cinereus*)

MYLU* indicates that other *Myotis* species presumed misidentified by EchoClass were combined under Little brown bat (*Myotis lucifugus*). These include Indiana bat (*Myotis sodalis*) and Eastern small-footed bat (*Myotis leibii*), neither of which has been documented in Minnesota, although the structure of their calls is quite similar to those of the Little brown bat.

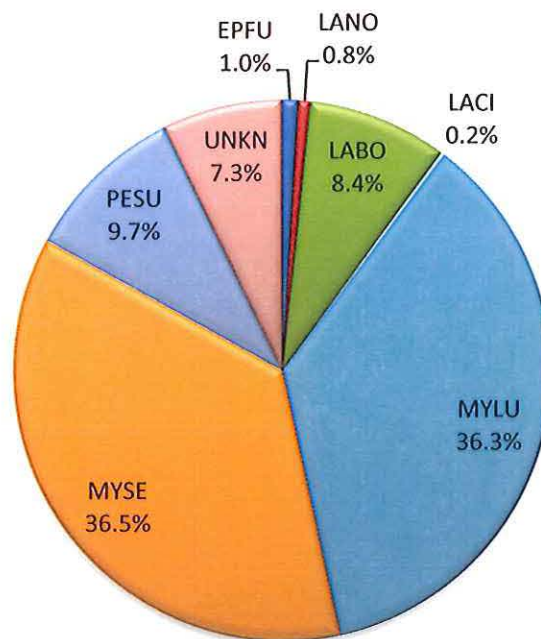
SITE 01 - BCID



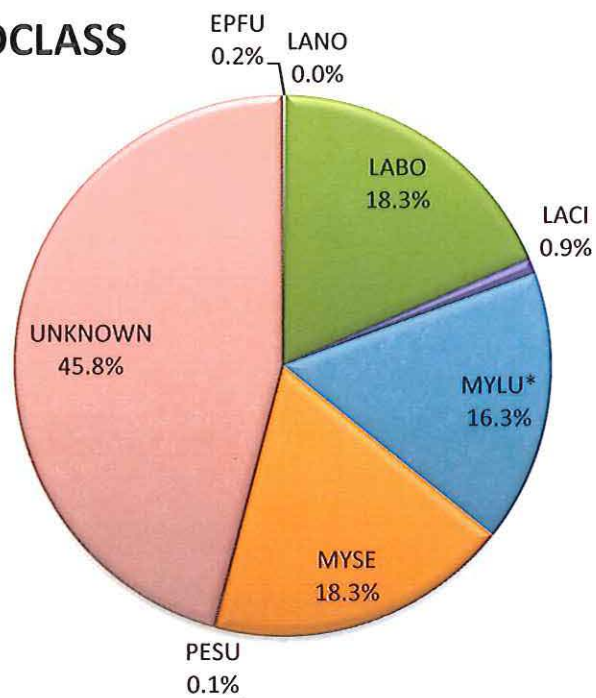
SITE 01 - ECHOCCLASS



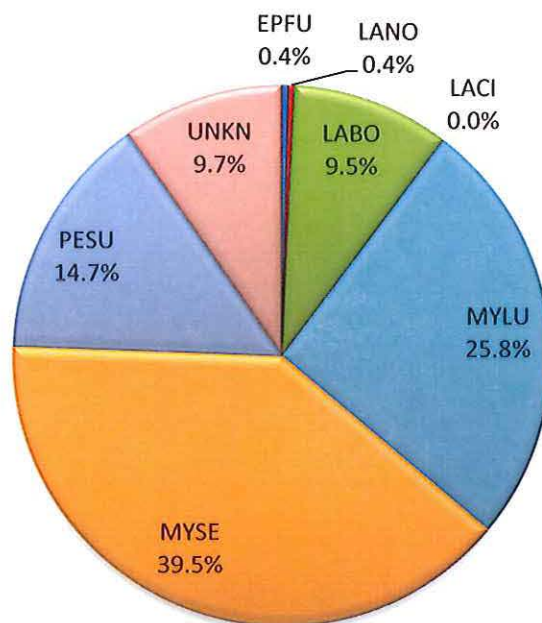
SITE 02 - BCID



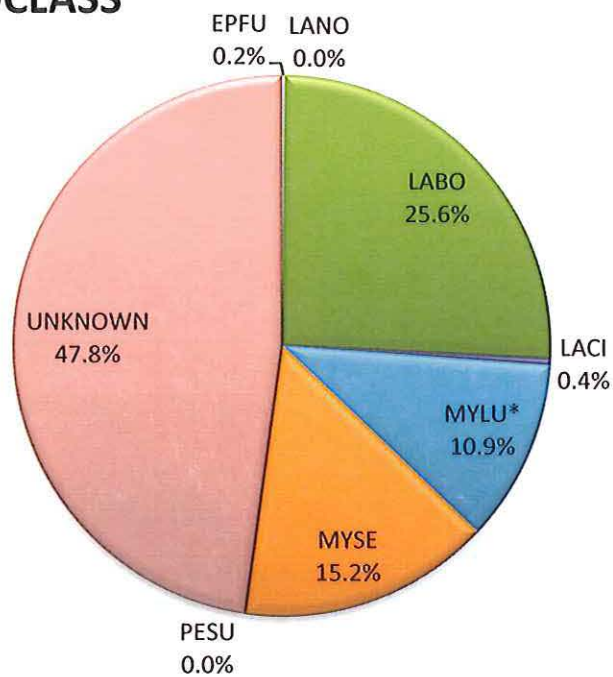
SITE 02 - ECHOCCLASS



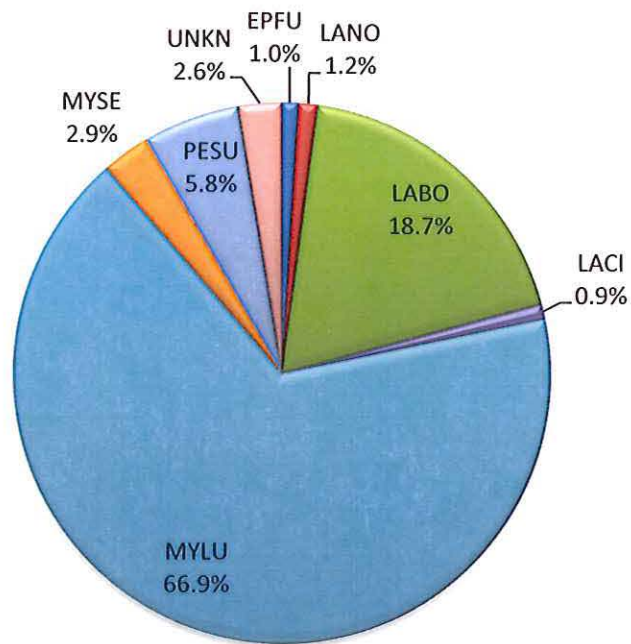
SITE 03 - BCID



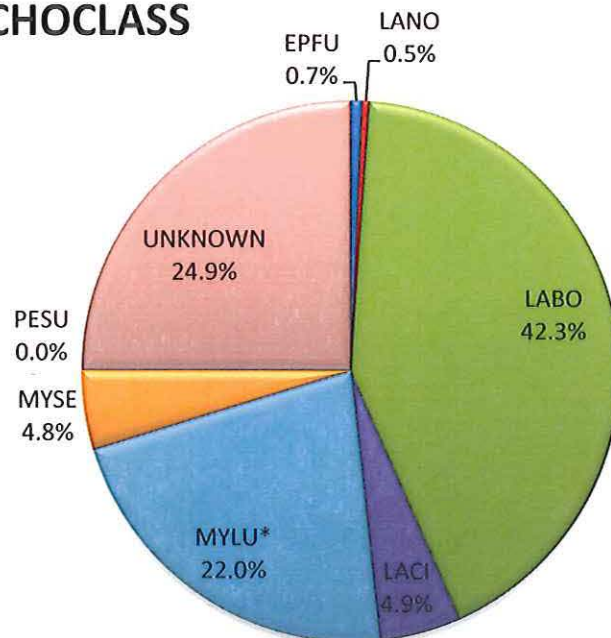
SITE 03 - ECHOCCLASS



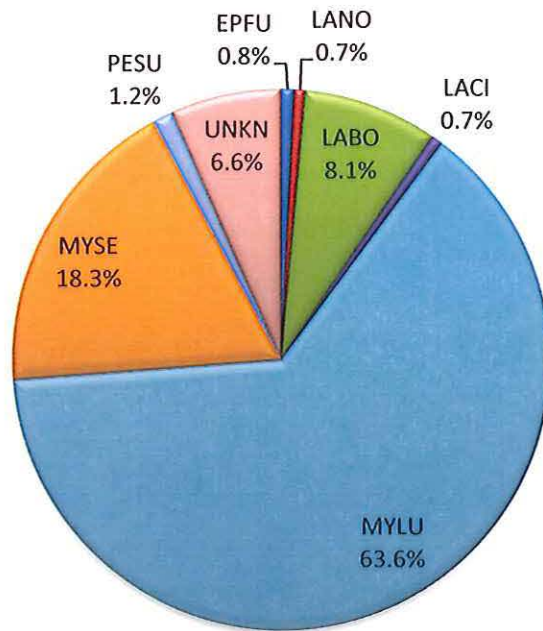
SITE 04 - BCID



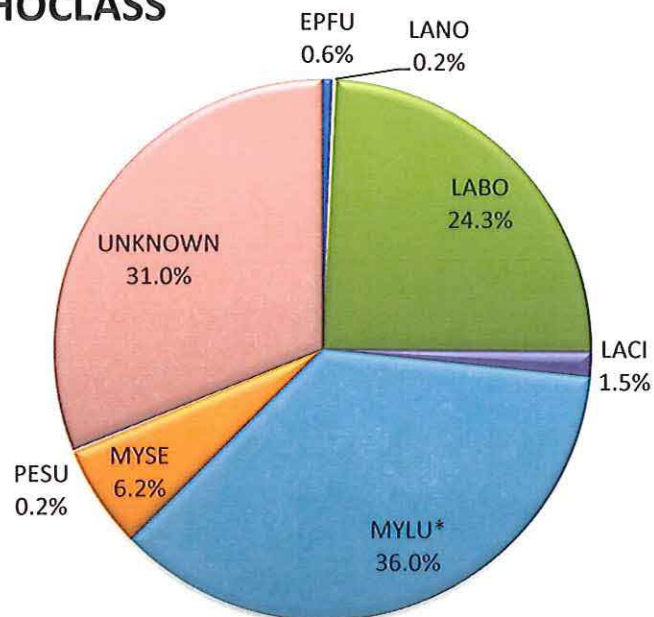
SITE 04 - ECHOCCLASS



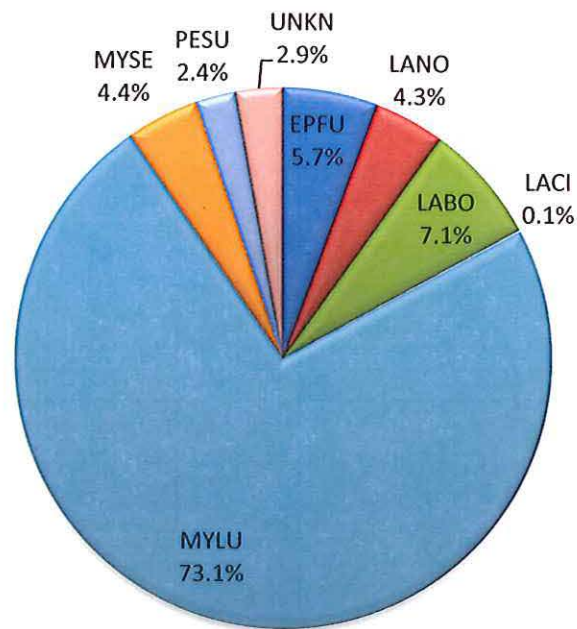
SITE 05 - BCID



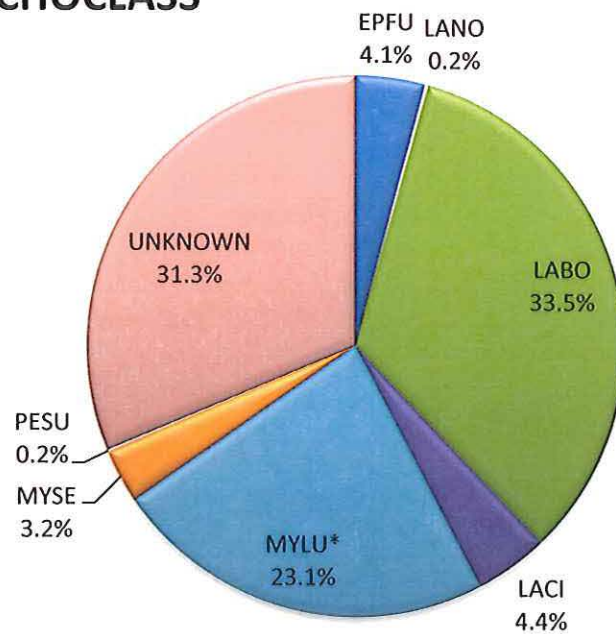
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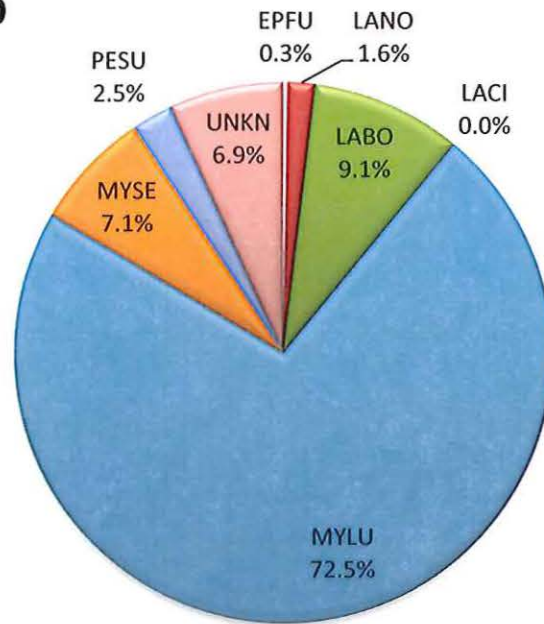
SITE 06 - BCID



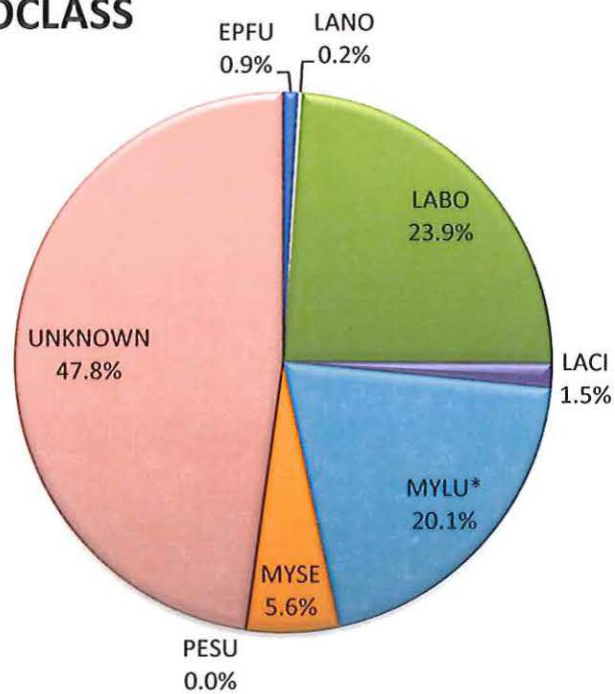
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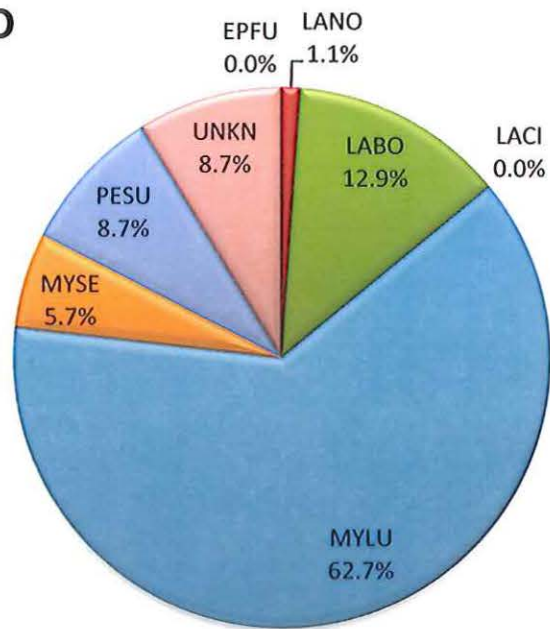
SITE 07 - BCID



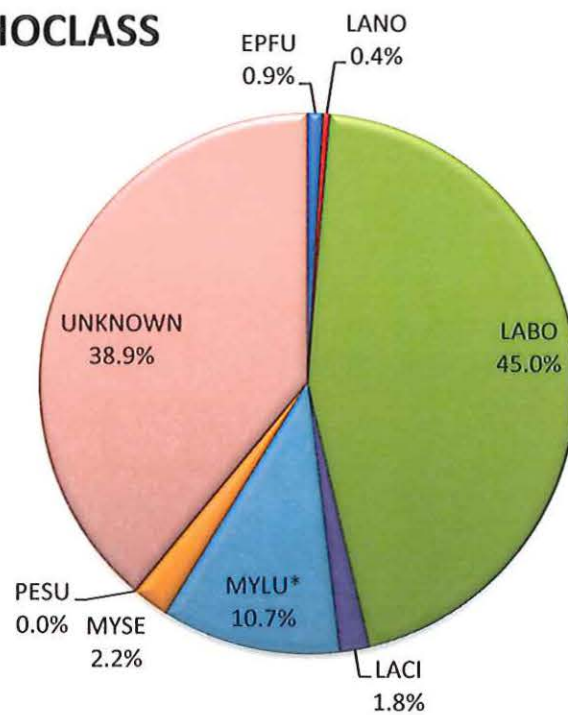
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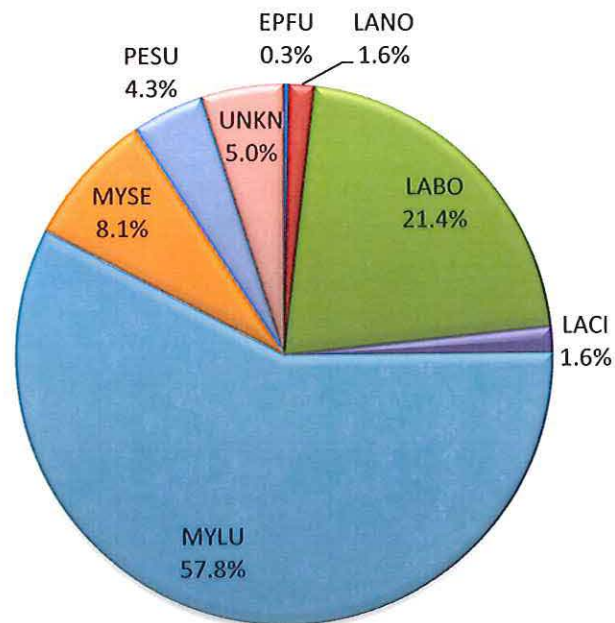
SITE 08 - BCID



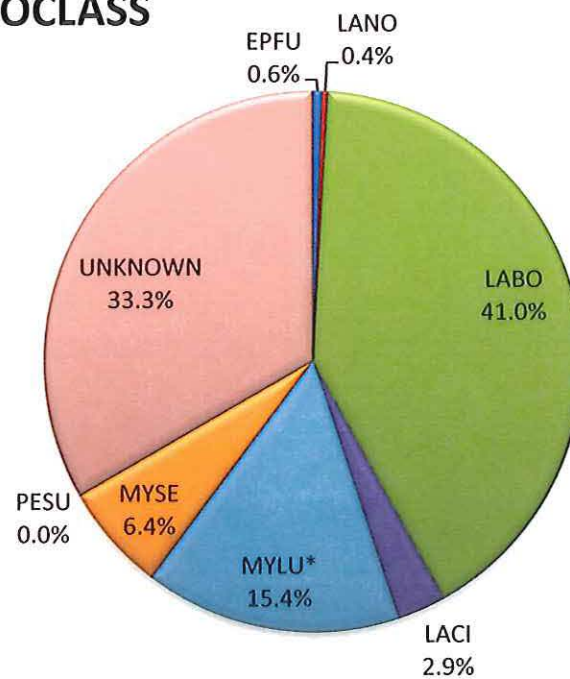
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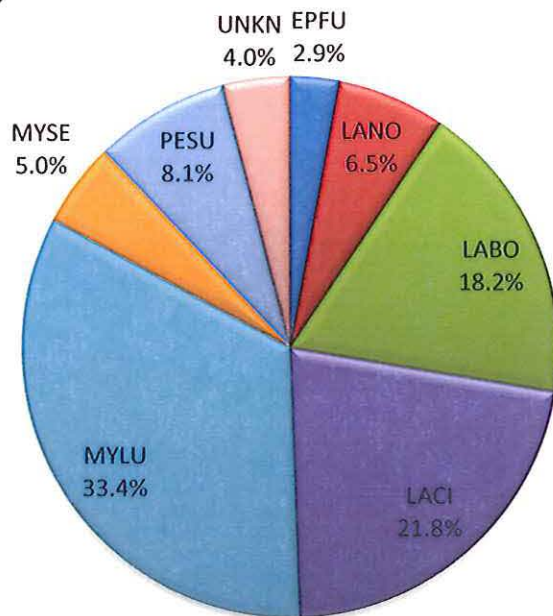
SITE 09 - BCID



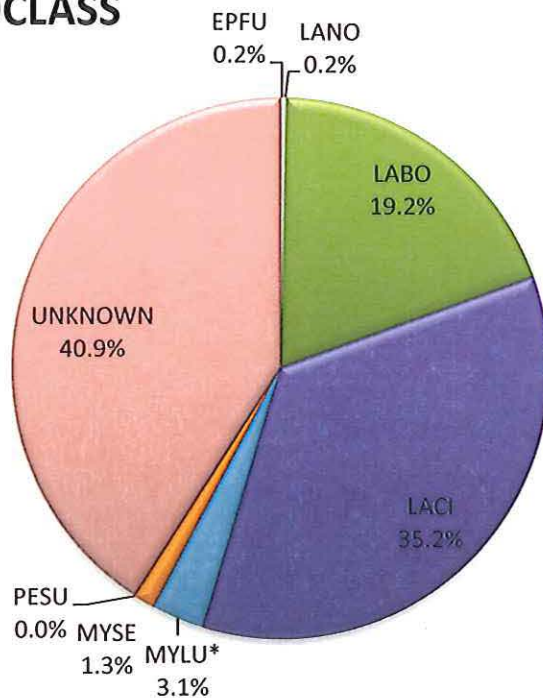
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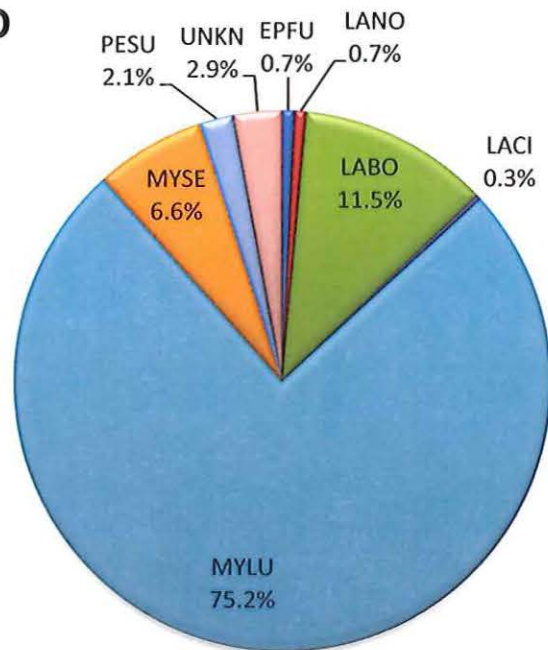
SITE 10 - BCID



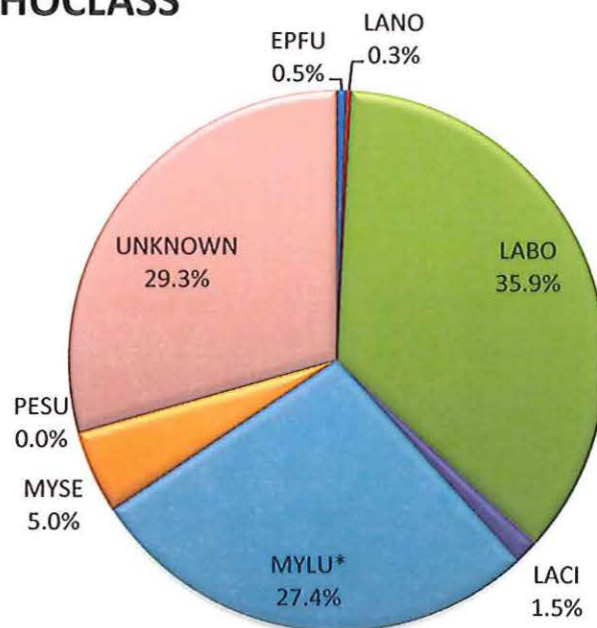
SITE 10 - ECHOCCLASS



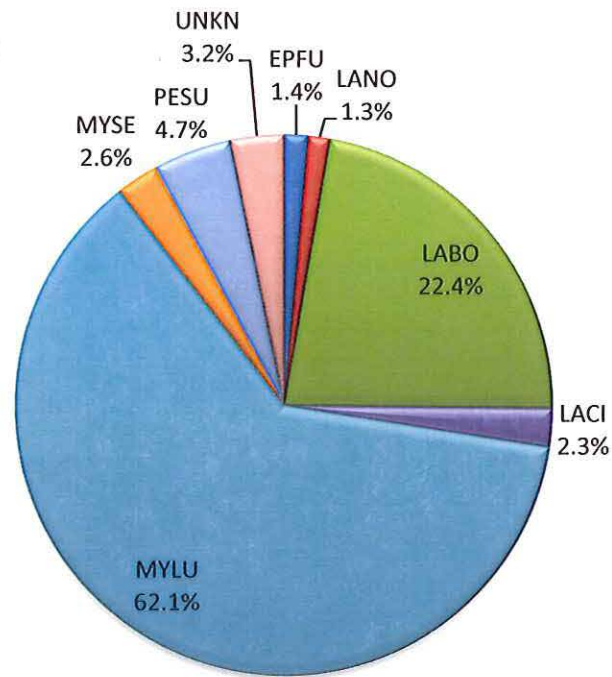
SITE 11 - BCID



SITE 11 - ECHOCCLASS



SITE 12 - BCID



SITE 12 - ECHOCCLASS

